Trademark Information

LAUNCH is a registered trademark of LAUNCH TECH. CO., LTD. (LAUNCH for short) in China and other countries. All other LAUNCH trademarks, service marks, domain names, logos, and company names referred to in this manual are either trademarks, registered trademarks, service marks, domain names, logos, company names of or are otherwise the property of LAUNCH or its affiliates. In countries where any of the LAUNCH trademarks, service marks, domain names, logos and company names are not registered, LAUNCH claims other rights associated with unregistered trademarks, service marks, domain names, logos, and company names. Other products or company names referred to in this manual may be trademarks of their respective owners. You may not use any trademark, service mark, domain name, logo, or company name of LAUNCH or any third party without permission from the owner of the applicable trademark, service mark, domain name, logo, or company name. You may contact LAUNCH by visiting Launch at http://www.cnlaunch.com, or writing to LAUNCH, Xinyang Building, Bagua 4th Road, Shenzhen, Guangdong Province, P. R. C., to request written permission to use Materials on this manual for purposes or for all other questions relating to this manual.

Copyright Information

Copyright © 2000 by LAUNCH TECH. CO., LTD. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of LAUNCH. The information contained herein is designed only for the use of this unit. LAUNCH is not responsible for any use of this information as applied to other units.

Neither LAUNCH nor its affiliates shall be liable to the purchaser of this unit or third parties for damages, losses, costs, or expenses incurred by purchaser or third parties as a result of: accident, misuse, or abuse of this unit, or unauthorized modifications, repairs, or alterations to this unit, or failure to strictly comply with LAUNCH operating and maintenance instructions.

LAUNCH shall not be liable for any damages or problems arising from the use of any options or any consumable products other than those designated as Original LAUNCH Products or LAUNCH Approved Products by LAUNCH.

General Notice

Other product names used herein are for identification purposes only and may be trademarks of their respective owners. LAUNCH disclaims any and all rights in those marks.

Disclaimer

- To take full advantage of the unit, you should be familiar with the engine.
- All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make change at any time without notice.

This unit is made for the purpose of persons who have special techniques and certifications.

Safety Precautions

Read all service procedures and precautions, installation instructions and equipment operating manuals thoroughly. Failure to observe these precautions, or the improper use of equipment, could result in property damage, serious injury or death. Never allow improperly trained personnel to perform these procedures or operate equipment.

- Read the operating instructions before attempting to operate the unit. Keep this manual with the unit at all times.
- Care must be taken as burns can occur from touching hot parts of the equipment or in the engine.
- Do not operate equipment with a damage cord or if the equipment has been dropped or damaged until it has been examined by a qualified service person.
- Do not let cord hang over edge of table, bench or counter or come in contact with hot manifolds or moving fan blades.
- If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less current than the equipment may overheat.
- Always unplug equipment from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.
- Let equipment cool completely before putting away. Loop cord loosely around equipment when storing.
- For continued protection against risk of fire, do not operate equipment in the vicinity of open

pdf.sunwayinfo.com.cn

container contained with flammable liquid (gasoline).

- Make sure that the unit is in the well-ventilation area when operating the fuel engine.
- Keep lighted cigarettes, sparks, flames or other ignition sources away from fuel systems at all times.
- Keep the operator's hair, clothes, fingers or the other parts of body away from the running parts of the unit.
- In order to prevent the unit from being beat, do not contact the working unit at damp part or operate the unit in the rain.
- Please operate the unit according to the methods listed in the manual. Use the accessories accommodated by product manufacturer.
- Do not switch on the ultrasonic system when there is no ultrasonic cleanser in the ultrasonic cleaning chamber, otherwise, it may damage the ultrasonic cleaner.
- Keep the unit well grounded.
- Provide ventilation through an exhaust gas removal system, ventilation fans or large doors. Inhalation of carbon monoxide gas, which is odorless and colorless, can cause serious illness, injury or death.
- Avoid contact with hot surfaces such as exhaust pipes, radiator, etc.
- Before testing vehicles, put the transmission lever in NEUTRAL position, apply the parking brake, and block the front wheels.
- ALWAYS WEAR SAFETY GOGGLES. Common used glasses are NOT safety glasses.
- When disconnecting any connector of the pressurized fuel pipe, wrap the connector with towel to prevent the fuel from spurting out. Spurted fuel may cause personal injury or fire.
- Test liquid is used by the main unit. Cleanser is used for on-vehicle cleaning. The ultrasonic cleaning uses specified ultrasonic cleanser (It can be replaced by cleanser provided together with the unit).

gpd.sunwayinfo.com.cn

Table of Contents

General Information 2
Functions 2
Features: 2
Specifications 2
Structure 2
Overview 2
Control panel 4
Installation & Connection 4
Installation 4
Connection 4
Operating Procedures 5
Sequences 5
Tidy-up 5
Operation 5
Ultrasonic Cleaning 5
Uniformity/Sprayability Test 5
Leakage Test 7
Injecting Flow Test 7
Auto. Test 8
On-Vehicle Cleaning 11
Maintenance 11
1.Transportation and Storage 11
2. Transportation & Storage of Naked Unit 12
3. Installation Environment 12
4. Vulnerable Parts List 12
5. Test Liquid and Cleanser Selecting or Replacing 12
6. O-ring Replacing 12
7. Filter Replacing 12
8. Precautions 12
FQA 13
Appendix I: Pressure Gauge of Injection System 14
Appendix II: Circuit Diagram 15
Appendix III: Pipeline Diagram 16

spd.sunwayinfo.com.cn

Note: This user's manual is an introduction to the structure, functions, operations, cautions, maintenance and troubleshooting for the proper use of the equipment.

General Information

Thank you for purchasing the CNC-601A/801A injector cleaner & tester manufactured by LAUNCH TECH CO., LTD. Developed with the technology of ultrasonic cleaning and fuel pressure control, CNC-601A/801A is an advanced electromechanical product, which can clean and test injectors by simulating engine working conditions. It can also perform cleaning on the injectors and fuel supply system on vehicle.

Functions

- Ultrasonic cleaning: To perform simultaneous cleaning on several injectors and to remove the carbon deposits on the injector completely.
- Uniformity/Sprayability test: To test the uniformity of injecting amount of each injector, and to monitor the spraying status of each injector with the help of backlight. This test is also for reverse flush.
- Leakage test: To test the sealing and dribbling conditions of injectors under system pressure.
- Injecting flow test: To check the injecting amount of the injector in 15 seconds of constant injection.
- Auto. test: To test injectors by simulating different working conditions.
- On-vehicle cleaning: The unit is equipped with various adaptors and couplers that facilitate cleaning on the injectors on vehicle.

Features:

- Adopting the powerful ultrasonic cleaning technology, CNC-601A/801A offers complete cleaning to the injectors.
- Fuel pressure control through microcomputer offers stable pressure control and large adjustable range, which is suitable for all EGI vehicles and can help to achieve automatic cleaning and testing of injectors.
- With the help of microcomputer control and digital display, CNC-601A/801A makes possible automatic cleaning, testing injectors and real-time monitoring of the dynamic values.
- Automatic fuel draining through preset programs for some test items. Test liquid/cleanser can also be drained by pushing a button on the control panel after the test.

Specifications

Operating condition:

- Temperature: -10~+40°C;
- Relative humidity: ＜85%;
- Intensity of outer magnetic field: ＜400A/m;
- No naked flame within 2m.

Specifications:

- Power supply: □AC220V±10%/50Hz~60Hz □AC110V±10%/ 50Hz~60 Hz
- Input power: 250W;
- Ultrasonic cleaning power: 100W;
- Simulated RPM range: 10～9990rpm; step: 10rpm;
- Count range: 1～9999 times;
- Pulse width: 0.5～25ms; step 0.1 ms;
- Fuel tank capacity: 4700ml;
- Dimensions: 550mm×530mm×1400 mm;
- Weight: About 80kg.

Structure

Overview

CNC-601A/801A injector cleaner& tester is installed in a cabinet with four casters at the bottom for easy operating and moving, as shown in Fig.01.

The cover is designed as a slide curtain, which can be pulled up before operating. Under the curtain is the control panel and workbench. There are two layers in the cabinet part, upper layer is for an ultrasonic cleaner working; and the lower layer is a drawer for placing tools. There are four pieces of casters under the base seat.

gpdaunwayinfo.com.cn

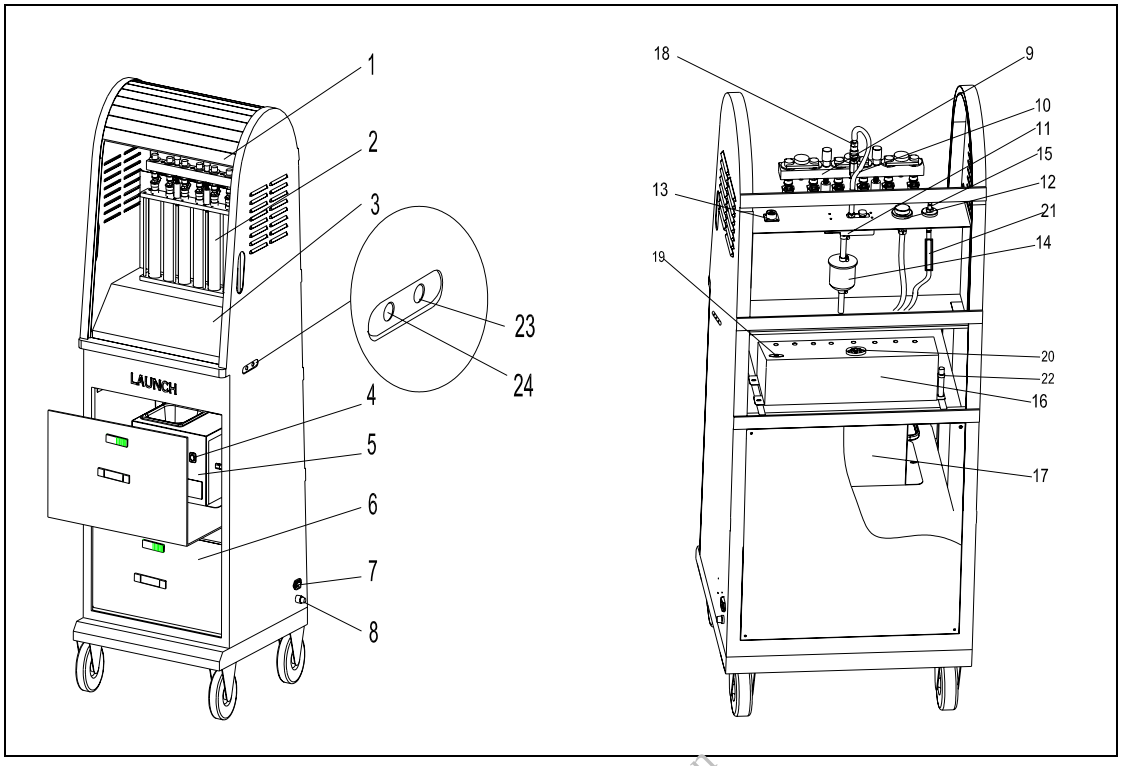


Fig.01

gpd.sunwayinfo.com.cn

1. Curtain;
2. Measuring cup;
3. Control panel;
4. Power switch of the ultrasonic;
5. Ultrasonic cleaner;
6. Drawer;
7. Power socket;
8. Fuse;
9. Fuel distributor;
10. Snap-on fuel pipe;
11.T-type block;
12. Overflow valve;
13. Socket for pulse signal cable.
14. Filter;
15. Fuel return hose;
16. Fuel tank;
17. Ultrasonic cleaner;
18. Quick connector;
19. Fuel level switch;
20. Fuel pump;
21. Fuel return observing tube;
22. Fuel tank level indicator;
23. Backlight switch;
24. Power switch.

Note:
The illustrations in this manual may be slightly different from the actual product!

Control panel

The control panel is as shown in Fig.02 (The control panel of CNC-601A is the same as that of CNC-801A.)

Fig.02

The control panel is classified into five areas from left to right as shown in the following table:

Area	Description
Item selection	● Select a function by pressing a [◊] key. The corresponding indicator will come on.
Parameter selection	● Select a parameter by pressing a [◊] key. The corresponding indicator will come on.
Parameter display	● After selecting function and parameter, user can set the parameter value by pressing [◄] / [►] keys. ([►] key for increasing, and [◄] key for decreasing.) ● The set value will be displayed on the lower LCD, and the live fuel pressure on the upper LCD.
System control	● To control the draining, stopping and running of CNC-601A/801A.
System pressure control	● Adjust system pressure by pressing [Increase pressure] / [Decrease pressure] key.

gpd.sunwayinfo.com.cn

Installation & Connection

Installation

1) Loosen the strip that tightens the outlet hose.
2) Take the pulse signal cables from the box and insert it into the socket on the top right side of the machine and tighten it.
3) Take the pulse signal cables from the box and insert it into the socket on the right upper of the ultrasonic cleaner and tighten them.
4) Take the two adjusting screws out from the box and install them to the press plates on the top of the glass tubes.
5) Take the two knurled nuts from the box and install them on the adjusting screws.
6) Take the fuel distributor from the box and install it on the knurled nuts and tighten them with the pressing screws.

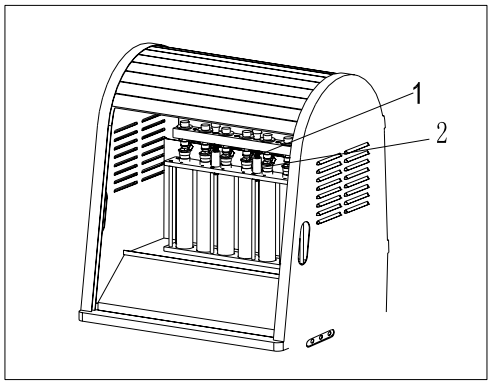


Fig.03 (The upper installation figure of the main unit)
1-Adjusting screw ; 2-Knurled nut.

Connection

1) Take the power cables out from the kit and insert them into the input socket at the bottom of the unit.
2) Take the drawer for placing the ultrasonic cleaner and insert the power cables into the socket of the ultrasonic cleaner.

Operating Procedures

Preparation

1) Remove the injector from the vehicle to see o-ring inside the injector for its damage. Replace it with the same type if necessary to avoid leakage during testing. Put the outside of injectors in gasoline or cleanser, and wipe them with a soft cloth after cleaning the outside oil sludge carefully.
2) Check and fill the test liquid. Fill the test liquid through fuel filling port on the side of the main unit and observe the liquid level in the fuel level viewer. In most cases, fill the liquid up to 1/2 of the tank capacity.
3) Press the switch of the backlight and the power on the right side of the main unit.
4) Fill proper ultrasonic cleanser or special ultrasonic cleanser into the ultrasonic cleaning chamber up to soaking the needle valve.
5) Connect the injectors with the right couplers.

> *Note:*
> *Test liquid and cleanser are provided together with the unit. The test liquid is used for uniformity/sprayability test, leakage test, injecting flow test and auto. test. The mixture of fuel and cleanser is used in on-vehicle cleaning. The ultrasonic cleaning uses special ultrasonic cleanser (or test liquid and cleanser that comes with by the unit).*

Sequences

A complete cleaning and testing sequence shown below should be followed:

- Ultrasonic cleaning;
- Uniformity/Sprayability test;
- Leakage test;
- Injecting flow test;
- Auto. test.

Select and set up the corresponding parameter according to the various testing purpose. For detailed operations, please refer to "Operation" part.

Tidy-up

Remember to do the following work after cleaning and testing:

- Press [Drain] button to drain the test liquid into fuel tank.
- Switch off the power and unplug the power connector plug.
- Dump the ultrasonic cleanser to its original bottle, and then wipe the ultrasonic cleaner with a soft cloth.
- Clean the CNC-601A/801A control panel with a soft cloth.
- Drain the test liquid from the tank into a container to avoid volatilization. Store the liquid in a safe place if it can be used again, or dispose of it in accordance with relevant regulations if it is too dirty.

Operation

Ultrasonic Cleaning

CNC-601A/801A takes advantage of the penetrability and cavitation impact wave caused by ultrasonic wave traveling through the medium to provide powerful cleaning on objects with complex shapes, cavities and pores, so that the stubborn carbon deposits can be removed from the injectors.

Procedures:

1) Connect the power supply: connect one end of the power cable to the power socket on ultrasonic cleaner and the other end to power socket.
2) Place the injectors which have gone through surface cleaning on the launder.
3) Add enough ultrasonic cleanser into ultrasonic cleaner so that the liquid level is about 20mm above the needle valve.
4) Plug the injector pulse signal wires to injectors respectively.
5) Turn on the power switch of the ultrasonic cleaner.
6) Select [Ultrasonic cleaning] in the function column by pressing "◊" key. Select [Timer] in the parameter column, and set the timer (the default time is about 10 minutes) in the value column. Press [Run] button to start cleaning.
7) When the time is up, CNC-601A/801A will stop automatically as the buzzer rings, and then turn off the power switch of ultrasonic cleaner.
8) Take the injectors out of the launder and wipe them with a dry soft cloth. Get ready for next operation.

> Note:
> *Before the ultrasonic cleanser is added into ultrasonic cleaner, do not turn on the ultrasonic cleaner.*

Uniformity/Sprayability Test

Uniformity test is to find out if the flow difference of the injectors meets the requirement or specifications under the same working condition. This test can reflect the

gpd.sunwayinfo.com.cn

comprehensive influences on the injector caused by electrical nature, bore variation and clogging. Sprayability test is to inspect the spraying performance by observing the injectors.

Installing and testing procedures for top-supply injectors

1) Choose the fuel distributor stopper from the coupler box and mount a proper O-ring on it. Remember to apply a little lubricating oil on the O-ring. Mount the fuel distributor stopper onto the distributor.
2) Mount the crescent plate and tighten it with a bolt.
3) Choose a proper adaptor according to the injector type and mount it to the corresponding coupler under the fuel distributor.
4) Install the injectors in forward direction (Apply a little lubricating oil on the O-ring.)
5) Install the fuel distributor and the injector on the fuel distributor supporter with a proper adjustable screw and knurled nuts, and tighten two riffle screws (black). See Fig. 04.
6) Connect the injector pulse signal wire.
7) Before doing this test, press [Drain] button to drain the test liquid from the measuring cup if there is any.
8) Choose [Uniformity/Sprayability test] on the control panel, set corresponding parameters (consult the appendix for pressure setting, consult vehicle manuals for other parameters as needed), and then press [Run] button to start the test. (CNC-601A/801A can be switched between [uniformity test] and [sprayability test] by pressing [Drain] key when it is running.)
9) When the test is completed, CNC-601A/801A will auto stop at the ring of the buzzer.

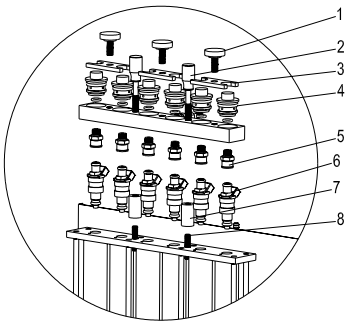


Fig. 04

1-Plate bolt; 2-Riffle screw; 3-Crescent plate; 4-Fuel distributor stopper; 5-Adapter for fuel top-supply injector; 6-Injector;7-Knurled nut; 8-Adjustable screw

Installing and testing procedures for side-supply injectors

1) Choose proper couplers for side-supply injectors and proper O-rings, and mount them together. (Remember to apply a little lubricating oil.)
2) Mount the injectors on the couplers and install them onto the fuel distributor.
3) Mount the cross plate and tighten it with bolts.
4) Mount the fuel distributor and injectors onto the fuel distributor supporter, and tighten them with two riffle screws (black). See Fig. 05.
5) Connect the injector pulse signal wire.
6) Before doing this test, press [Drain] button to drain the test liquid from the measuring cup if there is any.
7) Select [Uniformity/Sprayability test] on the control panel, set the corresponding parameters and press [Run] button to start the testing. (CNC-601A/801A can be switched between [uniformity test] and [sprayability test] by pressing [Drain] key when it is running.)
8) When the testing is over, CNC-601A/801A will auto stop at the ring of the buzzer.

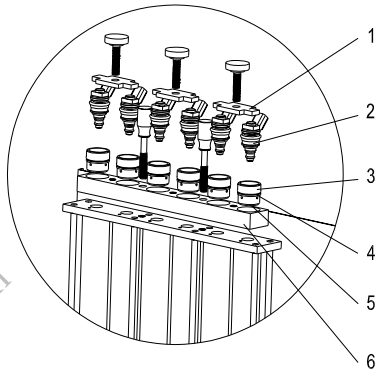


Fig. 05

1-Cross plate; 2-Fuel side-supply injector; 3- Coupler for fuel side-supply injector; 4,5-O-ring; 6-Fuel distributor

gpd.sinwayinfo.com.cn

Note:

- *While testing, CNC-601A/801A can be switched between [uniformity test] and [sprayability test] by pressing [Drain] key. At default, solenoid valve is set at the closed state. Uniformity test can be done at this state. When [drain valve] key is pressed, solenoid valve will drain oil and sprayability test can be performed.*
- *The default cylinder number of the system is 0, which means that all injectors are working when CNC-601A/801A is running. A specific cylinder can be selected by setting the number of the cylinder.*
- *The system pressure can be adjusted by pressing [Decrease pressure] / [Increase pressure] key when testing.*
- *Keep the fluid level to at least 30 ml while testing. Foam will be produced in the liquid during injection. In order to prevent spillover, set the related parameter with reference to the following formula :*

$$\text{Pulse width(ms)} \times \text{time(s)} \times \text{speed(rpm)} / 120 \leq 18000$$

- *This is for checking the uniformity of each cylinder. Injecting difference of all injectors*

on one vehicle should be kept within 2% during uniformity testing.

- *During operation, the user can select parameter, such as RPM or PW, and then press [◄] or [►] key for simulation of changing working condition.*
- *Good injectors may have identical injecting angle, uniform spraying but no jet. Otherwise, replace the injector.*
- *In the sprayability test, a special electrical parameter--the minimum injection pulse width of injector--can be tested, to compare the injectors on the same engine. That is to set cylinder No., start the test from minimum injection pulse width, and then gradually increases the pulse width till the injector starts injection (observed with the help of backlight). The value set at this moment is the minimum injection pulse width, so the difference of minimum injection pulse width among these injectors could be observed.*

Reverse flush

CNC-601A/801A can also perform reverse flush by connecting with reverse adaptor at [Uniformity/Sprayability test] mode. Reverse flush is a way to clean the injectors with the test liquid flowing from the outlet to the inlet of the injector. Reverse flush may remove the dirt inside the injector or adhered on the screen. (For top fuel supply injector)

Procedures:

1) Choose the fuel distributor stopper from the coupler box and mount a proper O-ring on it. Remember to apply a little lubricating oil on the O-ring (so that O-ring damage and leakage can be avoided). Mount the fuel distributor stopper to the distributor.
2) Mount the crescent plate and tighten it with a bolt.
3) Choose a reverse flush coupler and proper O-ring, and mount them under the fuel distributor.
4) Install the injectors in reverse direction (outlet upward, and inlet downward).
5) Choose a proper coupler according to the shape of the injector and put it under the injector.
6) Install the fuel distributor assembly and the injectors on the fuel distributor supporter with a proper adjustable screw and knurled nuts according to the height of the injector, and tighten two riffle screws (black). See Fig. 06
7) Connect the injector pulse signal wire.
8) Set parameter, and press [Run] button to start cleaning.
9) When the cleaning is over, CNC-601A/801A will automatically stop at the ring of the buzzer.

Note:

- *The system pressure can be adjusted by pressing [Decrease pressure]/[Increase pressure] key when performing reverse flush.*
- *It is advisable to press [Drain] key to avoid spillover of test liquid during reverse flush.*

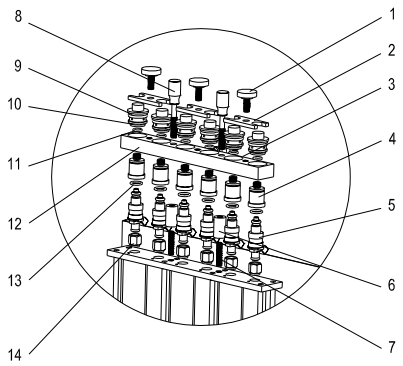


Fig. 06

1-Plate bolt; 2-Crescent plate; 3-Fuel distributor stopper; 4-Reverse adaptor; 5-Injector; 6-Knurled nut; 7-Adjustable screw; 8-Riffle screw; 9,10,11-O-ring; 12-Fuel distributor; 13-O-ring; 14-Couplers.

Leakage Test

Leakage test is to inspect the sealing conditions of the injector needle valve under system pressure and to find out if the injector is dribbling.

Procedures (Refer to Uniformity/ Sprayability Test **for installation):**

1) Before doing this test, press [Drain] button to drain the test liquid from the measuring cup if there is any.
2) Select [Leakage test] mode on the control panel. Press [Run] key to start the machine. At this time the system pressure can be adjusted as per the manufacturer's specifications (preferably 10% higher) by pressing [Decrease pressure]/[Increase pressure] key to observe if the injector is dribbling.
3) When the test is over, CNC-601A/801A will auto stop at the ring of the buzzer.

Note:

- *In general, the drip of the injector should be less than 1 drop within 1 minute (or in accordance with the specifications).*
- *The default time of the system is 1 minute.*

Injecting Flow Test

Injecting flow test is to check if the injecting flow in 15 seconds meets the specifications for injecting amount. The deviation reflects the wear or clogging in the injector, instead of electrical parameter variation.

gpd.sunwayinfo.com.cn

Procedures (For installation refer to Uniformity / Sprayability Test):

1) Before this test, press [Drain] button to drain the test liquid from the measuring cup if there is any.
2) Choose [Injecting flow test] item on the control panel, and press [Run] button to start the test. Adjust the fuel pressure by pressing [Decrease pressure]/[Increase pressure] key according to the injector specification.
3) When the test is over, CNC-601A/801A will stop automatically at the ring of the buzzer.

Auto. Test

Auto. test contains all tests above-mentioned (15-second injecting test, idle speed, middle speed, high speed, varying acceleration, varying deceleration, changing pulse width test). This function can test more comprehensive performance of injectors by simulating the various engine working conditions.

Procedures (For installation refer to Uniformity / Sprayability Test):

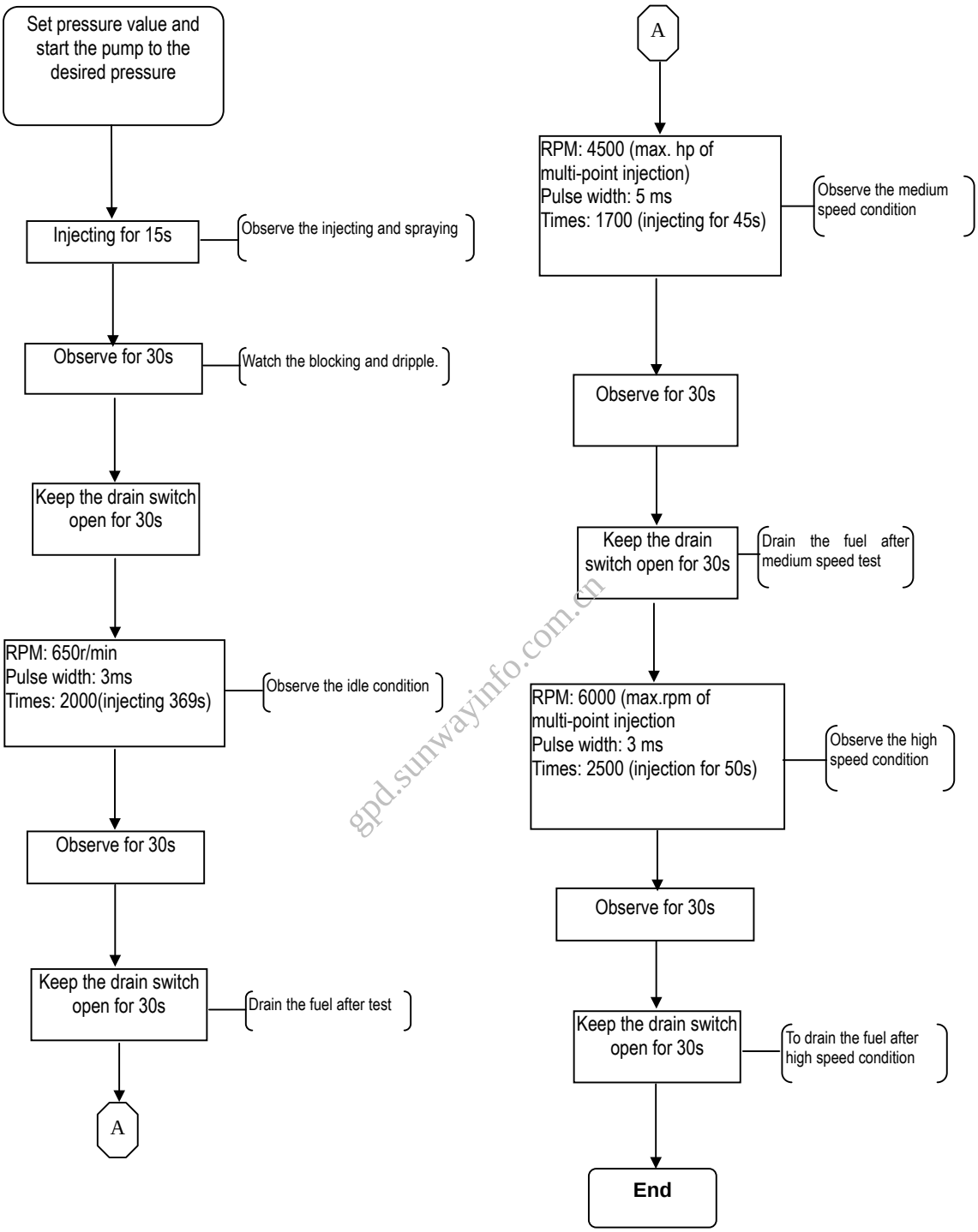
1). Before the test, press [Drain] button to drain all the test liquid in the measuring cups if there is any.
2). Select [Auto. test] item on the control panel and set up the pressure value according to the injector specifications, select the test mode (mode 1, 2, or 3 are all available), and then press [Run] button to start the test.
3). Adjust the fuel pressure by pressing [Decrease pressure]/[Increase pressure] key when testing.
4). When the test is over, CNC-601A/801A will auto stop at the ring of the buzzer.

ftp.sunwayinfo.com.cn

Note:

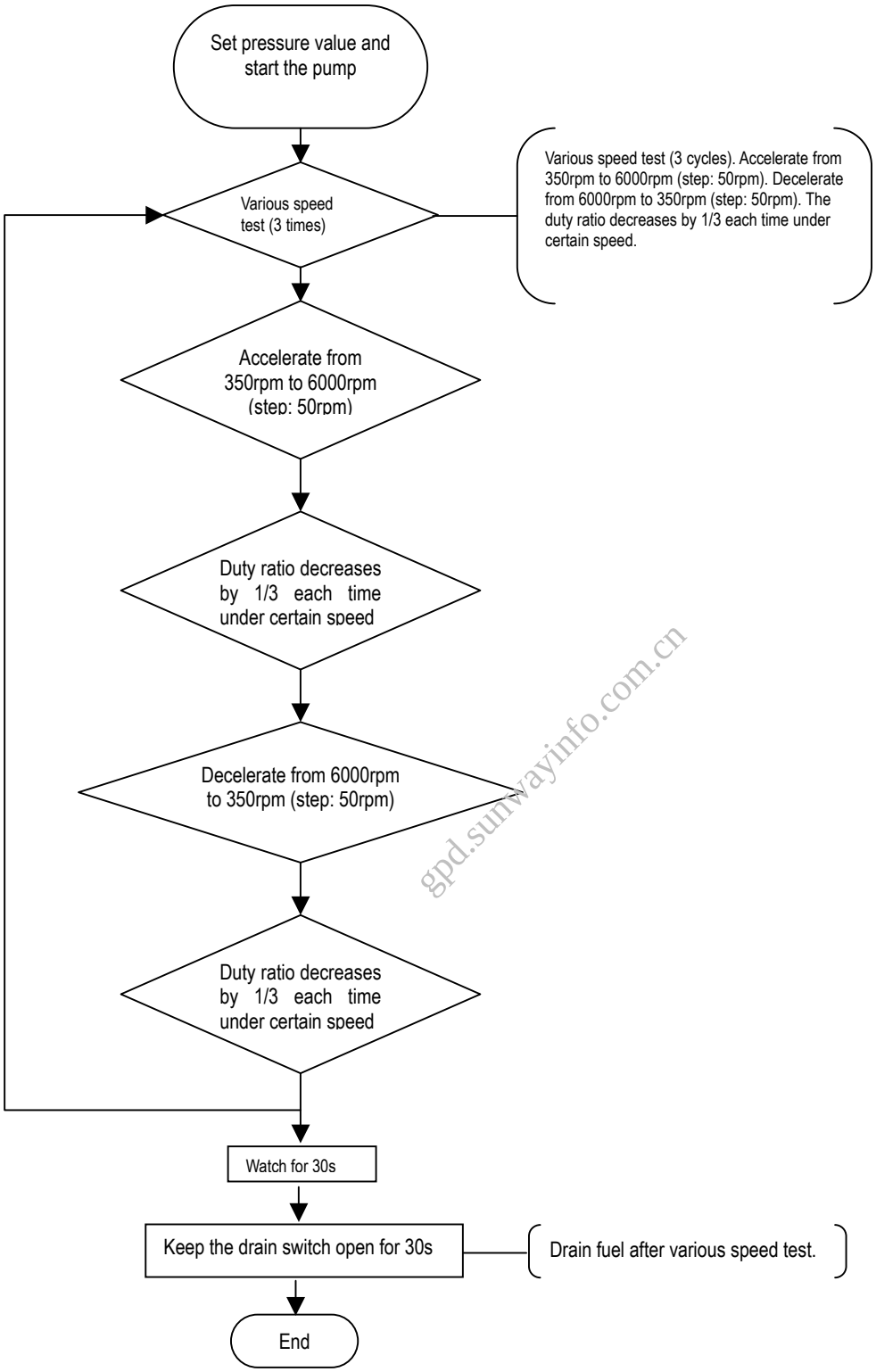
- *Mode 1 is the default mode.*
- *Mode 3=Mode 1 + Mode 2*

Mode I of Automatic Test


Set pressure value and start the pump to the desired pressure
Injecting for 15s
Observe the injecting and spraying
Observe for 30s
Watch the blocking and dripple.
Keep the drain switch open for 30s
RPM: 650r/min
Pulse width: 3ms
Times: 2000(injecting 369s)
Observe the idle condition
Observe for 30s
Keep the drain switch open for 30s
Drain the fuel after test
A
A
RPM: 4500 (max. hp of multi-point injection)
Pulse width: 5 ms
Times: 1700 (injecting for 45s)
Observe the medium speed condition
Observe for 30s
Keep the drain switch open for 30s
Drain the fuel after medium speed test
RPM: 6000 (max.rpm of multi-point injection
Pulse width: 3 ms
Times: 2500 (injection for 50s)
Observe the high speed condition
Observe for 30s
Keep the drain switch open for 30s
To drain the fuel after high speed condition
End

gpd.sunwayinfo.com.cn

Mode II of Automatic Test


Set pressure value and start the pump
Various speed test (3 times)
Various speed test (3 cycles). Accelerate from 350rpm to 6000rpm (step: 50rpm). Decelerate from 6000rpm to 350rpm (step: 50rpm). The duty ratio decreases by 1/3 each time under certain speed.
Accelerate from 350rpm to 6000rpm (step: 50rpm)
Duty ratio decreases by 1/3 each time under certain speed
Decelerate from 6000rpm to 350rpm (step: 50rpm)
Duty ratio decreases by 1/3 each time under certain speed
Watch for 30s
Keep the drain switch open for 30s
Drain fuel after various speed test.
End

gpd.sunwayinfo.com.cn

On-Vehicle Cleaning

After the engine has been in operation for a period of time, its fuel flow may be blocked or become un-smooth owing to buildup of dust and impurities in fuel channel. In addition, the carbon deposits and gum made by combustion can easily adhere to the injectors, inlet and outlet ports, inlet and outlet pipes, throttle and combustion chamber. So the fuel supply system, combustion chamber and injectors of the engine must be cleaned on a timely basis. On-vehicle cleaning is a solution that can save your time and labor.

Procedures:

1) Please check if there is test liquid or cleanser inside the fuel tank before on-vehicle cleaning. If test liquid is in the tank, replace it with cleanser. The detailed procedure to be followed: remove the level indicator on the left of the main unit, and drain the test liquid inside fuel tank into a container. If the drained test liquid contains lots of impurities and can not be reused, please dispose it in the proper way and fill with new test liquid. If the drained test liquid is clean, please store it for later using.
2) Blend the cleanser with the fuel at a certain ratio, and fill the mixture into the fuel tank. (Consult the user's manual of cleanser for blending ratio.) Refer to the following table for filling amount, as shown in the following table:

No. of cylinders	4 cylinder	6/8 cylinder
Amount	about 800~1000 ml	about 1500ml

3) Locate the fuel inlet pipe and return pipe on the vehicle fuel supply system, and disconnect them respectively.
4) Connect the fuel inlet pipe and return pipe together, and open the fuel tank cover; or remove the pump fuse as long as other systems are not affected.
5) Disconnect the snap-on oil pipe connected to the fuel distributor.
6) Connect one end of the fuel inlet pipe of on-vehicle cleaning with a quick male connector to female connector for the fuel outlet hose of the main unit, and the other end with a proper quick connector to the fuel inlet pipe of the fuel supply system on the vehicle.
7) Connect the engine fuel return pipe to the return pipe of on-vehicle cleaning through an adaptor, and connect the other end of the return pipe with snap-on connector to the connector on top of CNC-601A/801A. See Fig.07 for the correct connection.
8) Choose [On-vehicle cleaning] function on the control panel, and set the time and press [Run] button to start the test. Refer to specifications required by various vehicle types to adjust system pressure by pressing [Decrease pressure]/[Increase pressure] key.
9) Press [Stop] button at any time to stop the cleaning.
10) After the on-vehicle cleaning is completed, please clean the fuel tank and pipeline with test liquid (if there is residual cleanser inside fuel tank, please.). The detailed procedure is shown as follows: drain the liquid inside the fuel tank out and dispose it on the clean degree, and then fill little test liquid and turn on the power. Select "Leakage test" item and press [Run] key to run the unit for about 2~3 minutes. When the unit stops, drain the test liquid from fuel tank and dispose the liquid as related regulation.

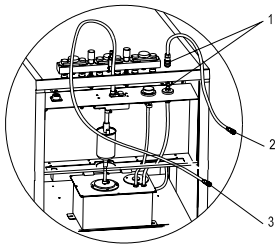


Fig.07
1-Quick connector for fuel-return pipe of engine;
2-Fuel-return connector;
3- Fuel-inlet pipe for engine

Note:
1) When cleaning, care must be taken as the cleanser is inflammable. Prepare for a fire extinguisher.
2) Be sure that all pipelines are well connected and there is no leakage on the pipelines before performing cleaning.

gpd.sunwayinfo.com.cn

Maintenance

1. Transportation and Storage

It is advisable to transport the unit by hand or forklift.

1) Transportation

A. Before the unit is transported, the liquid inside the fuel tank should be drained completely to avoid overflowing.
B. To prevent the unit from shocking and knocking, make sure it is on the base seat and in the packing case during transportation. Firstly pack the unit with the matter similar with plastic strip and add the filling material (such as foam or sponge, etc.) between the unit and packing case to avoid

scratching the surface when the unit shakes.

C. Make sure that the maximum incline angel does not exceed 45°. Do not place the unit upside down.

2) Storage

Store only in dry area and keep away from water before the unit is unpacked.

2. Transportation & Storage of Naked Unit

1) Move only by hand or lift with soft belt.
2) Keep away from lifting tools or long-distance transportation.
3) The unit can be pushed on the flat hard ground, please unlock the brake setting of four casters at the bottom of the unit when moving.
4) Step on the brake pedal of casters to fix the unit after the unit is well placed.
5) Store the machine in well-ventilated area and do not expose it to direct sun shine or rain.

3. Installation Environment

1) Keep the distance between the unit and any wall or other substance is less than 200mm. The unit should be put in well-ventilated area. Make sure the temperature is within -10°C~ +40°C.
2) The unit has been well grounded for safety operation. Please confirm that the power socket is also well grounded.

> ⚠ *Warning!*
> *If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used.*

4. Vulnerable Parts List

Parts no.	Name	Specifications	Number	Remarks
103260003	Filter		1PCS	
104130016	Upper seal gasket for glass tube	¢ 40.2*22*3	6(8)PCS	Amount for one machine
104130017	Lower seal gasket for glass tube	¢ 40.2*15*3	6(8)PCS	Amount for one machine
	Various “O” ring			
199010019	Test liquid	4L	1PCS	
199010035	Cleanser	MIF-102 355 ml	2PCS	

gpd.sunwayinfo.com.cn

5. Test Liquid and Cleanser Selecting or Replacing

Test liquid and cleanser are shipped together with the unit. The test liquid is used in all tests except for on-vehicle cleaning, for which the mixture of fuel and cleanser is used (the blending ratio of cleanser and fuel is 1:4).The ultrasonic cleaning uses special ultrasonic cleanser (or test liquid and cleanser attached by the unit).

> ⓘ Note:
> *Impurities can be built up in the test liquid after being used for a period of time. Do not use contaminated test liquid, otherwise, injector and fuel pump can be blocked. Drain the test liquid by removing the level indicator on the left of the main unit. It is better to clean the fuel tank with a little test liquid before the tank is filled in with new liquid.*

6. O-ring Replacing

Replace the O-ring when it is deformed in order to avoid leaks during cleaning or testing.

7. Filter Replacing

The filter tends to accumulate impurities after a period of using. Replace the filter periodically to ensure CNC-601A/801A work normally. Select the [Leakage test] item to check if there is leak in the connector after replacement.

8. Precautions

1) Do not place anything on the control panel to avoid breaking the measuring cup because it is made from quartz.
2) Do not disconnect pipe before the system pressure reaches “0”.
3) For quick depressurization of pipes with CNC-601A/801A power off, the overflow valve is well adjusted before delivery. Don’t open the overflow valve cap at will to make any adjustment,

for it may affect the system pressure. If the fuel pressure couldn't reach "0" in one minute after CNC-601A/801A is switched off, or the operating pressure of system couldn't meet the requirements. Please use an inner-hexagonal spanner to turn the valve slug for a certain angle clockwise or counterclockwise and make further check.

4) Do not turn on the ultrasonic cleaner when there is no ultrasonic cleanser in the ultrasonic chamber. Otherwise, the cleaner may be damaged.
5) Always ensure that the provided power supply is well contacted with ground safely.
6) The unit is designed with warning function of lack fuel. When the level switch checks the liquid inside the tank less than the lowest line, the unit will utter the warning sound and meanwhile stop the fuel pump and injectors automatically, and then the unit returns to the stop state. The unit will stop warning until the liquid is supplied enough, at this time pressing the "Run" key will run the unit again.
7) Clean the control panel in time and Keep the pulse signal cables away from the test liquid and cleanser.

Note:
When adjusting the overflow valve, select [Leakage test] in item column, then run CNC-601A/801A. Adjust the pressure value by pressing [Decrease pressure] or [Increase pressure] key. The idea state of overflow valve is: satisfy the use requirement of maximum pressure when increasing pressure; decrease the pressure to "0" quickly when decreasing the pressure.

Warning!
Unauthorized repair may cause the extension of faulty area of the unit, which will bring trouble to general repair. Under the state of turning on the power, the electrical system inside the unit contains the factor causing danger. Failure to comply with these instructions could result in death or serious injury.

gpssunwayinfo.com.cn

FQA

1. The unit does not correspond when it is switched on.
   Check the fuse at lower right side of the unit and replace it with same type (AC250V/5A) if damaged or broken.
2. There is leakage in the fuel distributor coupler.
   Check the o-rings and replace it if damaged or unfitted. Do not tighten the two riffle screws too tightly; otherwise, it may cause leakage.
3. The fuel pressure drops slowly.
   The fuel pressure can not drop to zero with 1～2 minutes, adjust the overflow valve slightly with inner spanner counterclockwise.
4. The buzzer rings continually when there is no fuel pressure.
   The machine has the lack-fuel warning function and it will ring when the liquid in the fuel tank is lack, and then switch off the fuel pump and injectors and returns to the stop state. Supply the cleanser or test liquid to stop ringing. At this time, the fuel pump restarts only when pressing [RUN] pump.
5. Draining the test liquid in glass tube thoroughly requires pressing the [Drain] key more times.
   The solenoid valve has the function of stopping automatically after 15 seconds and drain more times if there is more liquid.

Appendix I: Pressure Gauge of Injection System

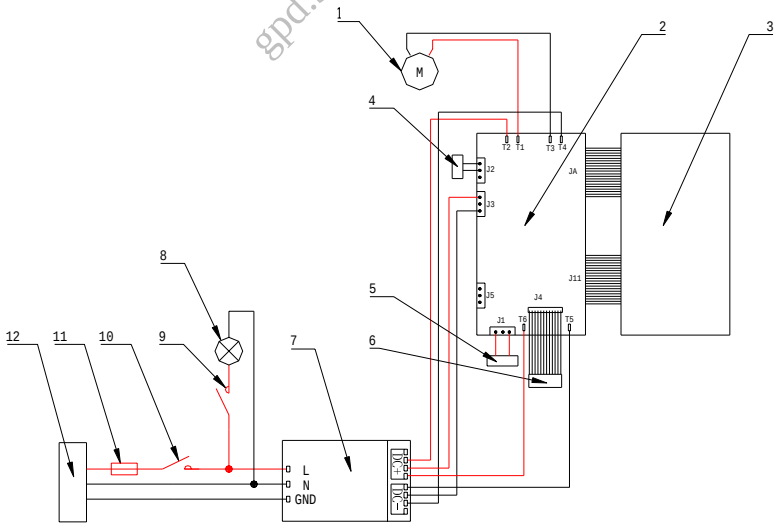
COMPANY	MODEL	SYSTEM PRESSURE （MPa）
TOYOTA	TOYOTA 3.0	0.284
	PREVIA	0.27—0.33
	LEXUS 300 400	0.265—0.304
	CAMRY 3.0	0.265—0.304
	LAND CRUISER	0.30
	COROLLA	0.27—0.31
HONDA	ACCORD 2.0 2.2	0.285
	CIVIC 1.5L	0.255—0.285
	LEGEND 3.2L	0.27—0.304
NISSAN	BLUE BIRD	0.25
	MAXIMA	0.25
	300EX	0.206—0.255
MITSUBISHI	V63000	0.35
MAZDA	323	0.20—0.22
	626	0.25—0.29
	929	0.25—0.29
BMW	528	0.27—0.29
GM	BUICK CENTURY	0.29—0.33
	BUICK PARK AVENUE	0.29—0.33
	CADILLAC 5.7	0.29—0.33
	LUMINA	0.23—0.30

gpd.sunwayinfo.com.cn

COMPANY	MODEL	SYSTEM PRESSURE （MPa）
	CORSICA	0.25—0.30
FORD	TEMPO 2.3L	0.28
	LINCOLN TOWN	0.206—0.308
CHRYSLER	CHEROKEE 213	0.273
	DODGE 3.3L DODGE CARAVAN	0.337
HYUNDAI	SONATA	0.265—0.275
DAEWOO	DAEWOO	0.28—0.30
AUDI	6 CYLINDER	0.24—0.27
	5, 4 CYLINDER	0.45—0.50
VOLKSWAGEN	JETTA	0.27—0.29
VOLVO	VOLVO	0.23—0.30

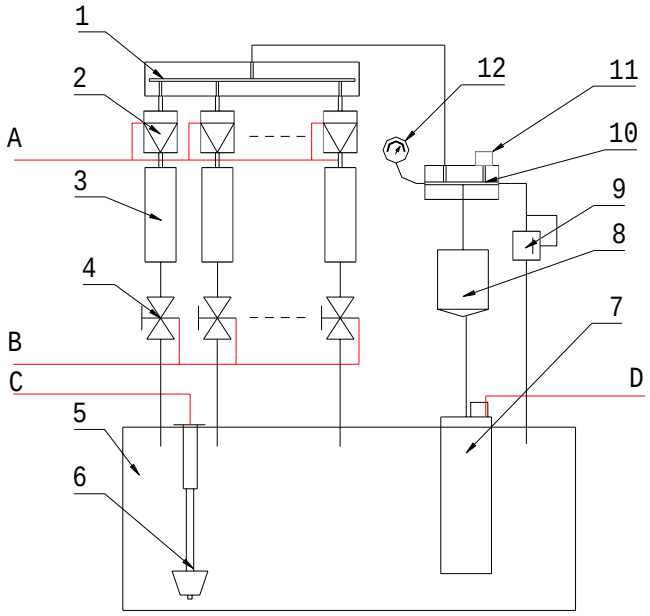
gpd.sunwayinfo.com.cn

Appendix II: Circuit Diagram



1- Fuel pump; 2-Driving board; 3-Control panel signal pulse cable；4-Lever switch; 5-Solenoid valve; 6-Injector; 7-Switiching type power; 8-Backlight; 9-Backlight switch; 10-Power switch ； 11-Fuse; 12-Power socket.

Appendix III: Pipeline Diagram



1-Fuel distributor；2-Injector；3-Tube；4-Solenoid valve；5-Fuel tank；6-Level switch; 7-Fuel pump; 8-Filter；9-Overflow valve；10-T-type block；11-Adaptor；12-Pressure gauge；A-Injector pulse signal cable；B- Control cable for solenoid valve；C-Control cables for level switch；D-Power control cables for fuel pump.

gpd.sunwayauto.com.cn

Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO PERSONS WHO PURCHASE LAUNCH PRODUCTS FOR PURPOSES OF RESALE OR USE IN THE ORDINARY COURSE OF THE BUYER'S BUSINESS.

LAUNCH electronic product is warranted against defects in materials and workmanship for one year (12 months) from date of delivery to the user. This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any automotive meter found to be defective is repair or replacement, and LAUNCH shall not be liable for any consequential or incidental damages. Final determination of defects shall be made by LAUNCH in accordance with procedures established by LAUNCH. No agent, employee, or representative of LAUNCH has any authority to bind LAUNCH to any affirmation, representation, or warranty concerning LAUNCH automotive meters, except as stated herein.

Disclaimer

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

gpd.sunwayinfo.com.cn

Order Information

Replaceable and optional parts can be ordered directly from your LAUNCH authorized tool supplier. Your order should include the following information:

1. Quantity
2. Part number
3. Item description

Customer Service

If you have any questions on the operation of the unit, please contact us:
Tel: 86-755-82269474,
Fax: 86-755-82264570,
E-mail: overseasales@cnlaunch.com.

If your unit requires repair service, return it to the manufacturer with a copy of the sales receipt and a note describing the problem. If the unit is determined to be in warranty, it will be repaired or replaced at no charge. If the unit is determined to be out of warranty, it will be repaired for a nominal service charge. Send the unit pre-paid to:

Attn: Overseas Department
LAUNCH TECH. CO., LTD.
Xinyang Building,
Bagua 4th Road,
Shenzhen, Guangdong Province,
China